

Discussion of

Can Restrictions on Exotic Lending Dampen Housing Price Volatility? A Panel VAR Exploration.

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Motivation

- Key question after the housing crisis
 - ▶ To what extent did relaxation of credit standards cause the housing boom?
 - ▶ Or did credit just flow to booming areas/areas that lenders correctly expected to boom?
- Specifically, proliferation of mortgages with “exotic” features as evidence of credit standards relaxation
 - ▶ Implicit first stage: exotic products relax borrowing constraints
- Extensively studied, but evidence is conflicting
- Important policy implications

This paper

- Panel VAR: “borrow” macro tool to study what is ultimately a macro question (but in previous empirical studies has been studied as a CX micro one)
- Variables: Interest rate, inflation, (local) employment, (local) house price appreciation, (local) share of exotic mortgages
- Panel: 1997Q1-2006Q4 and 123 CBSAs; subsamples to study geographic variation in relationships btw variables
- Identification through recursive ordering: shocks to exotic share do not contemporaneously affect HPA
- Findings
 - ▶ Expansion of “exotic lending” Granger-causes house price appreciation
 - ▶ FEVD: yet HPA mainly self-explained, 40% of exotic share explained by rates
 - ▶ IRFs: some evidence of causal effects of exotic share on HPA

Plan

- Context: what does the VAR approach contribute?
- Main comment: remaining identification challenges
- Other comments

Does Expanded Mortgage Credit Increase House Prices?

Ideal Experiment

- Ex-ante identical Island A and Island B, mainland that produces everything
- Go to banks on Island A, force them to offer exotic mortgage products
- House prices go up on Island A
 - ▶ Identified cause: only treatment was expansion of credit
 - ▶ Direct effect: no feedback through local demand causing boom in non-tradeable employment, population inflows, etc.

Empirical Challenges

- Challenge 1: finding plausibly exogenous variation in credit supply (specifically, in availability of exotic mortgages)
 - ▶ What the literature focuses on
 - ▶ CX study across boom or bust with instrument for credit supply
- Challenge 2: isolating the direct effect
 - ▶ What is the channel?
 - ▶ Direct: credit supply $\uparrow \implies$ housing demand $\uparrow \implies$ HPA \uparrow
 - ▶ Indirect: HPA $\uparrow \implies$ local demand $\uparrow \implies$ local employment $\uparrow \implies$ econ boom, pop inflow, etc. $\uparrow \implies$ housing demand $\uparrow \implies$ HPA \uparrow
 - ▶ Distinction important for policy: if indirect effect dominates and goal is to limit HPA volatility, maybe dampen demand response through gov't policy instead of restricting potentially optimal contract space?

Why VAR? It helps with Challenge 2

- With high-enough frequency, one would expect most indirect effects to be in the dynamics
- Contemporaneous direct and (some) indirect effects captured in Σ , dynamics are in the lag matrices
- Gauge dynamic amplification by zeroing out coefficients in the lag matrices and comparing IRFs

$$\begin{bmatrix} AD_t \\ HPA_t \\ CS_t \end{bmatrix} = \sum_{k=1}^p \begin{bmatrix} \rho_1^k & & \\ & \rho_2^k & \\ & & \rho_3^k \end{bmatrix} \begin{bmatrix} AD_{t-k} \\ HPA_{t-k} \\ CS_{t-k} \end{bmatrix} + \Sigma \begin{bmatrix} \eta_t^1 \\ \eta_t^2 \\ \eta_t^3 \end{bmatrix}$$

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- E.g. equivalent of my island example

$$\begin{bmatrix} AD_t \\ HPA_t \\ CS_t \end{bmatrix} = \sum_{k=1}^p \begin{bmatrix} \rho_1^k & & \\ 0 & \rho_2^k & \\ & & \rho_3^k \end{bmatrix} \begin{bmatrix} AD_{t-k} \\ HPA_{t-k} \\ CS_{t-k} \end{bmatrix} + \Sigma \begin{bmatrix} \eta_t^1 \\ \eta_t^2 \\ \eta_t^3 \end{bmatrix}$$

Main comment: VAR as a tool doesn't solve Challenge 1

- Granger causation vs. causation - example
 - ▶ X_{t-1} **Granger causes** Y_t
 - ▶ Both X_{t-1} and Y_t are both **caused** by exogenous Z_{t-k} for some $k \geq 1$
 - ▶ Upshot: Granger causation isn't causation because of the omitted variable Z_{t-k}
- Identification in VAR: choose one Σ from (infinite) set $\{\tilde{\Sigma} | \tilde{\Sigma}\tilde{\Sigma}' = \text{Var}[\eta_t]\}$
- This paper's approach: recursive ordering i.e. set Σ equal to the unique lower-diagonal $\tilde{\Sigma}$.
 - ▶ Contemporaneously, interest rate only responds to own shocks, share of exotic mortgages responds to all shocks
 - ▶ Idea: deal with omitted variables problem by including "everything" as a control
 - ▶ Usual concern with this approach: is "everything" really everything?
 - ▶ Additional concern: contemporaneous effect of exotic lending on other variables (including HPA) shut down

Alternative Approaches to Identification: Idea 1 (micro)

Find a more exogenous instrument for credit supply (“loose lending” in the paper’s language)

- i.e. replace raw “share of mortgages that have exotic features”_{*it*} with Z_{it}
- Borrow Z_{it} from literature on *negative* credit supply shocks during the bust to study *positive* shocks during the boom?
- E.g. Bartik instrument
 - ▶ Are some national lenders more associated with exotic lending? Is this characteristic sticky? If so,
 - ▶ Lender-year level liquidity shocks (from wholesale funding markets)
 - ▶ Project increase in lending on liquidity shocks at lender-year level
 - ▶ For each locale take weighted average of these projections weighing by pre-boom market share of these lenders.
 - ▶ Result: locale-year panel of exotic mortgage instruments

Alternative Approaches to Identification: Idea 2 (macro)

Event constraints (Ludvigson, Ma, Ng 2018)

- $\Sigma \epsilon_t = \eta_t$
- Σ must be such that orthogonal shocks ϵ_t backed out from the data in “special event” periods are consistent with our historical understanding of those periods
- E.g. shock to local employment in the Bay Area must be big and negative during bursting of tech bubble
- Discard $\tilde{\Sigma}$ from (infinite) set $\{\tilde{\Sigma} | \tilde{\Sigma} \tilde{\Sigma}' = \text{Var}[\epsilon_t]\}$ if it produces shocks that violate these restrictions
- Use Monte Carlo to compute FEVD ranges and IRF bands under all remaining $\tilde{\Sigma}$
- Weak assumptions can get you great power

Other Comments

- Share of loans to non-owner-occupiers: is it really a measure of expanded credit supply through exotic mortgages? Sounds more like increased housing demand by speculators
- Interest rates, inflation, local employment, and local house prices all available at monthly frequency. Loan-level (?) data from CoreLogic – why not estimate at monthly frequency?
- How to interpret the effect of local variables on national variables in lag matrix? E.g.

$$y_t = \alpha_0 + \alpha_1 y_{t-1} + \alpha_2 x_{i,t-1} + \epsilon_t$$
$$x_{it} = \delta_{i,0} + \delta_{it,1} x_t + u_{it}$$

- ▶ If $\delta_{it,1} = 0$ for all i, t , then by law of large numbers α_2 should be 0. But of course HPA and employment have strong national component, so α_2 is picking that up.
- ▶ Cleaner to put national x_t and local $x_{it} - x_t$ into the VAR separately
- ▶ Restrict lag matrices such that $x_{it} - x_t$ have 0 effect on national y_t

Conclusion

- Interesting paper!
- Studying the dynamics in a VAR setting can help us understand how credit supply shocks propagate, craft more targeted policies
- But recursive VAR does not assuage all identification concerns – more work needed to find causal evidence of credit supply on house prices in this setting
- Improvements there may help reconcile strong Granger causation with modest evidence of causation in FEVD and IRFs